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Planning Tool Suite – getCal; various & sundry

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Outline

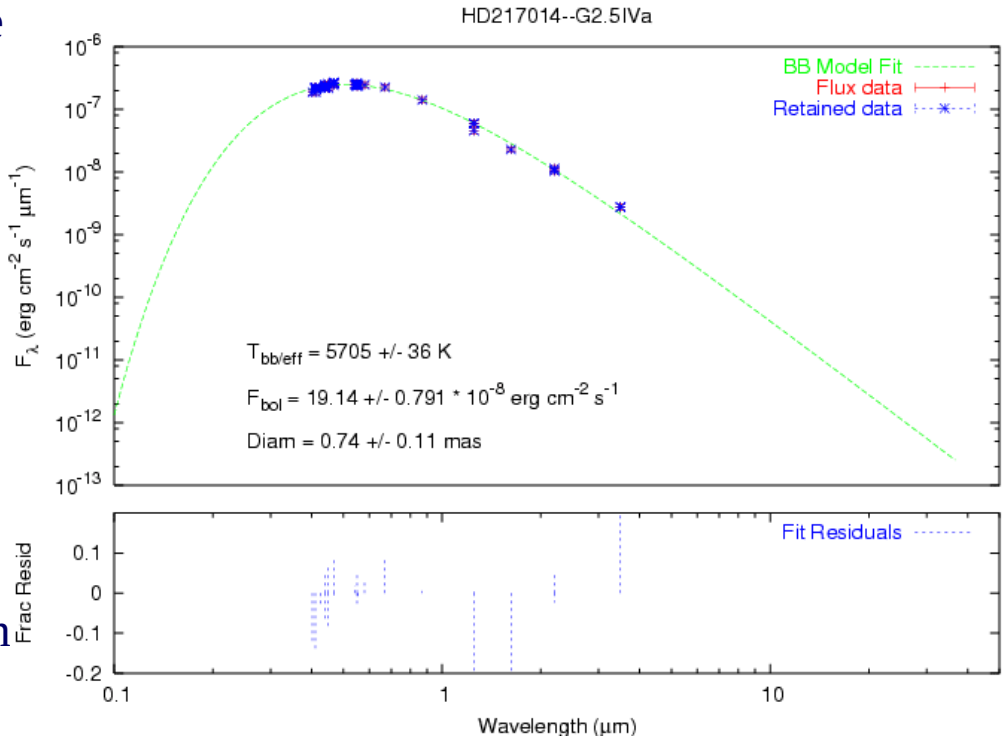
- Introduction to the getCal Suite
- Key Features
- Design Overview
- Illustrative Use Cases
- Installation/Dependencies
- Common Calibrators Catalog
- Supporting IAU WG Data Format
- Wrap-Up

Introduction to the getCal Suite

- getCal is a PTI-heritage Interferometry Experiment Planning Tool That Assists User in Composing an *Observation Plan*
- Designed With Wide (Unix) Portability in Mind (with web interface for non-Unix platforms)
- Implemented as Numerous Small Components; Interface Either Through Top-Level Glue-Scripts and GUIs or Directly With Components

Attributes of a Good Calibrator?

- Attributes of a "Good" Visibility Calibrator:
  - Unresolved (minimally resolved)
  - "Apparently" Single/Simple
  - Bright (or similar to target)
  - Similar observing geometry to target (near in sky)
  - Known size, *or* Properties leading to reliable size estimate
- Identifying Good Calibrators
  - Geometric search
  - Astrophysical constraints
  - Angular diameter estimation
  - Spectral energy distribution modeling
  - Ancillary information (e.g. Simbad classification & measurements, IR (2Mass) photometry)



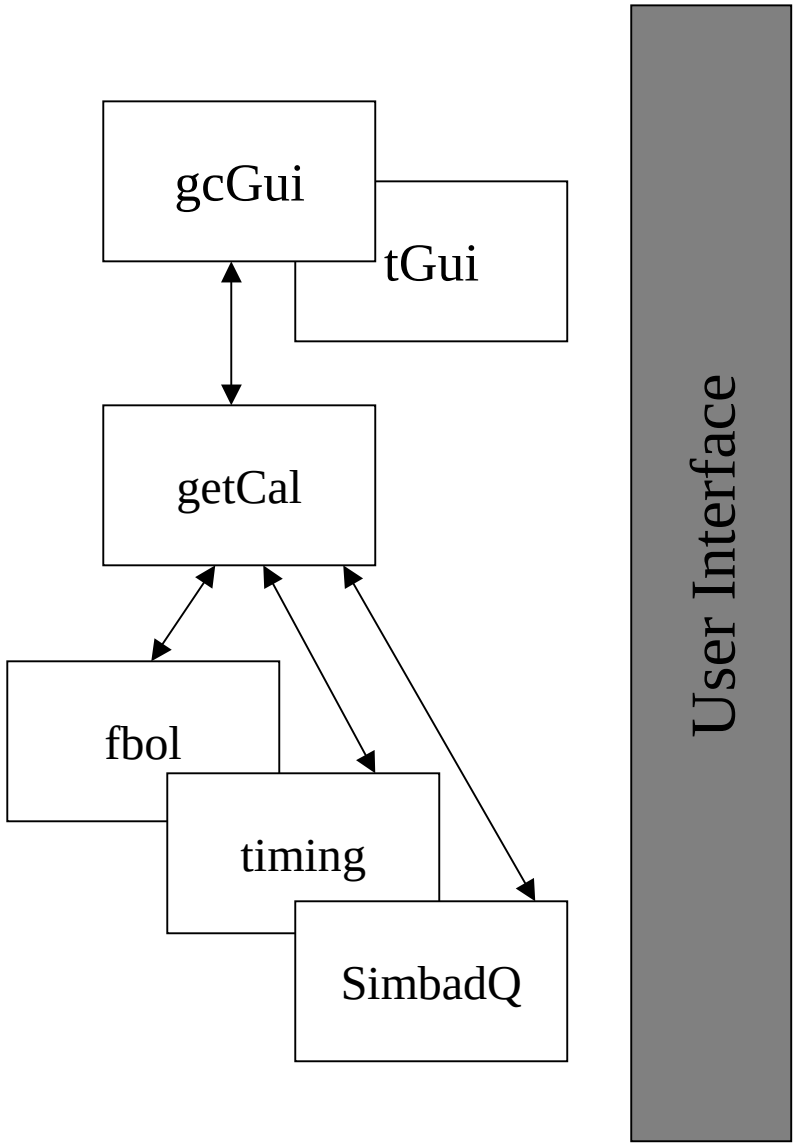
Key Features of getCal

getCal is an Experiment/Observation Planning Tool That:

- Resolves astronomical designations into standardized catalog entries and astrometry (via Simbad)
- Identifies potential visibility calibration sources according to various observational and/or astrophysical criteria
- Retrieve broad-band photometry from archival (Simbad, Catalog of Infrared Observations, ***2Mass***) sources and model spectral energy distribution (SED) with effective temperature/bolometric flux/angular diameter parameters
- Computes observing accessibility and geometry according to various constraints (annual, nightly, u-v tracks)
- Various GUIs that facilitate access to components, including new web-based interface (to roll-out soon)
- Interfaces to KI Control Components
  - Composes KI “Astronomical Observing Template” (AOT)
  - Keck “sky” planning application

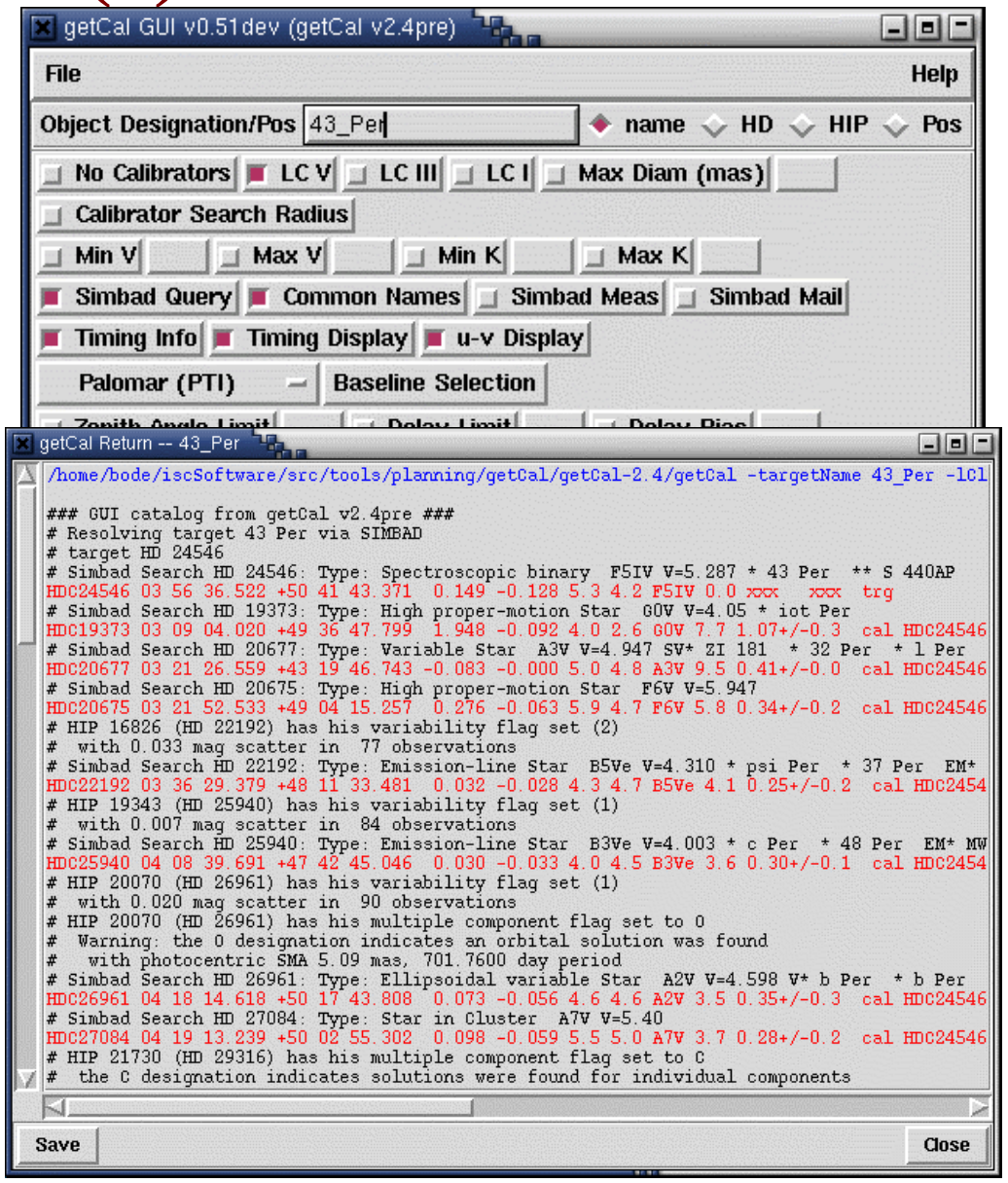
getCal Design Overview

- getCal is designed as multi-layer toolset
  - GUI level – GUIs that interface with command-line tools the facilitate interface or present results (e.g. gcGui, tGui)
  - Wrapper level – top-level scripts that provide consolidated functionality with command-line interface (e.g. getCal, gcList)
  - Component level – individual components that implement individual functions (e.g. Hipparcos catalog “cone search”, Simbad name resolution & information retrieval, accessibility calculations)
- Script (perl) implementation to enhance portability



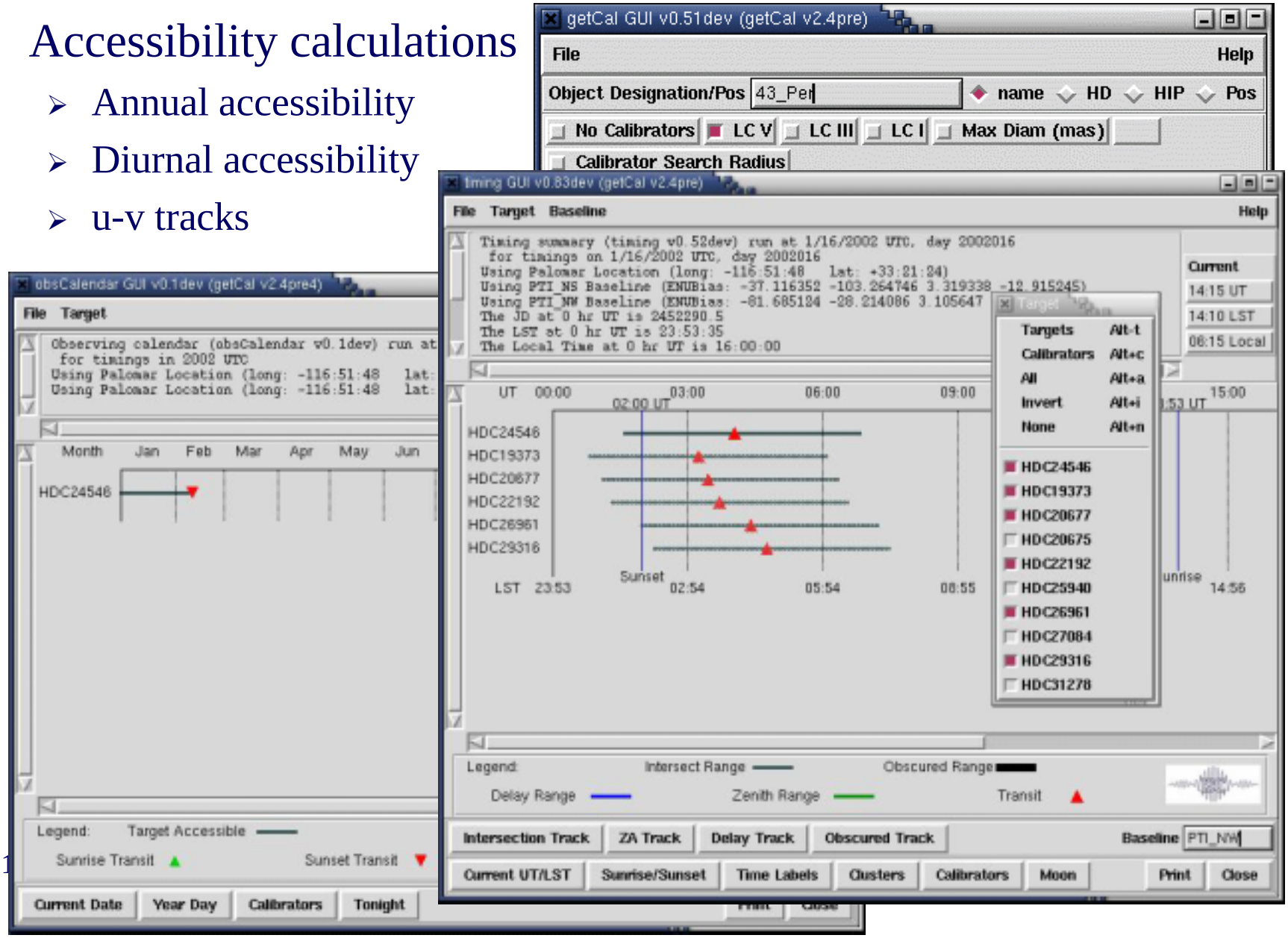
Illustrative Use Cases (1)

- Identify Candidate Calibrators for Given Source
  - Geometric search
  - Magnitude constraints
  - Astrophysical constraints (e.g. luminosity class, apparent diameter)
  - Multiplicity vetting



Illustrative Use Cases (2)

- Accessibility calculations
  - Annual accessibility
  - Diurnal accessibility
  - u-v tracks



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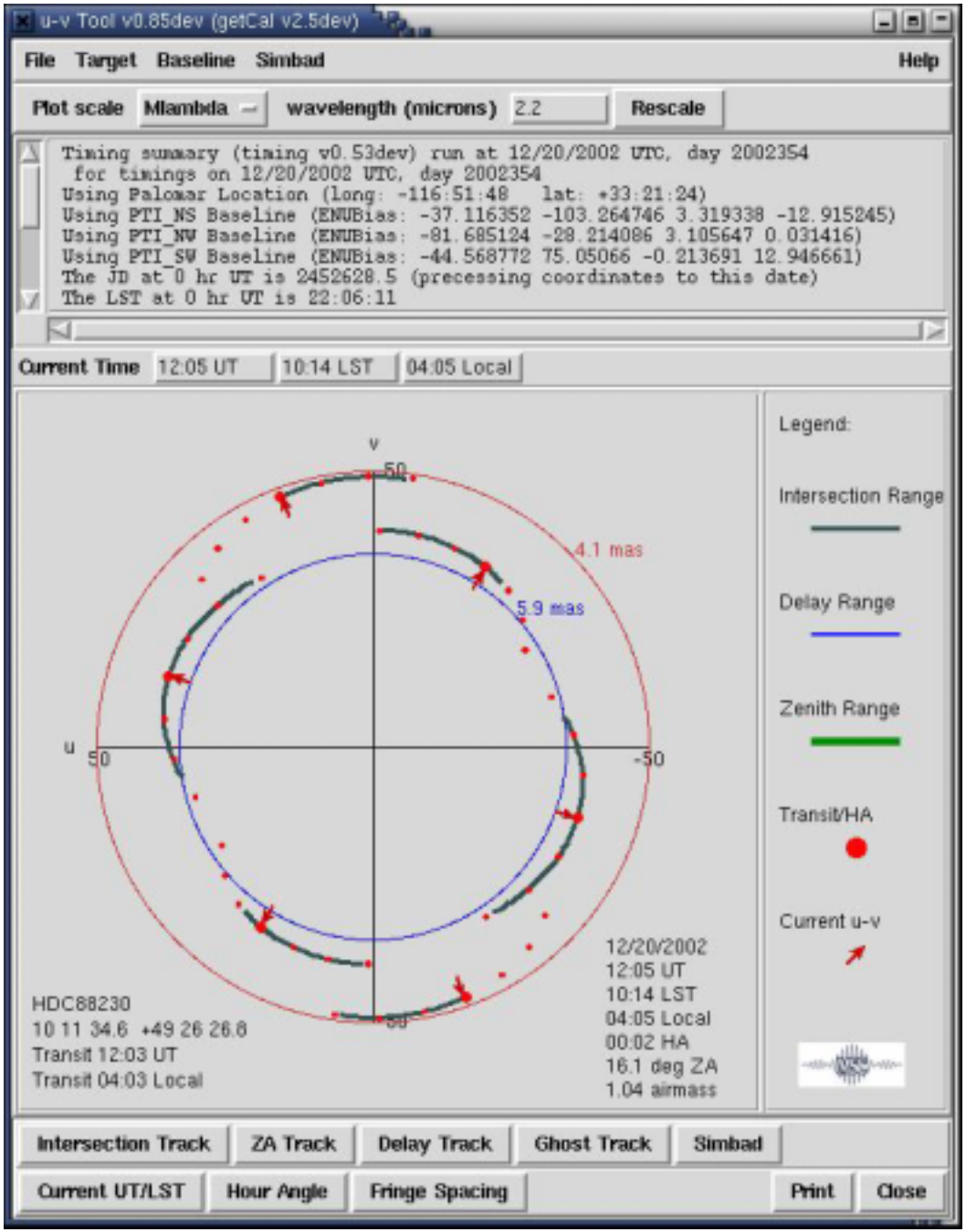
u-v Tracks

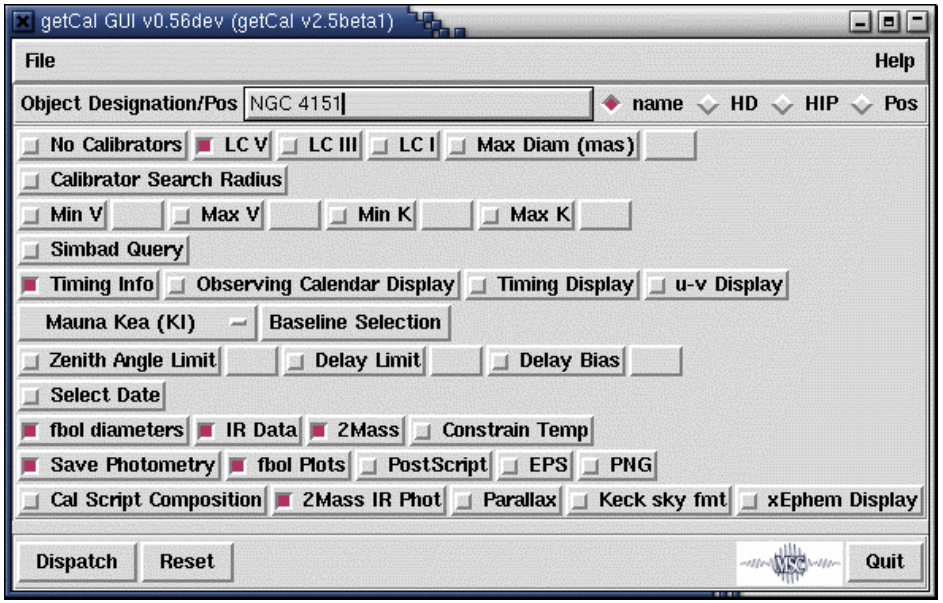
All Accessibility GUIs:

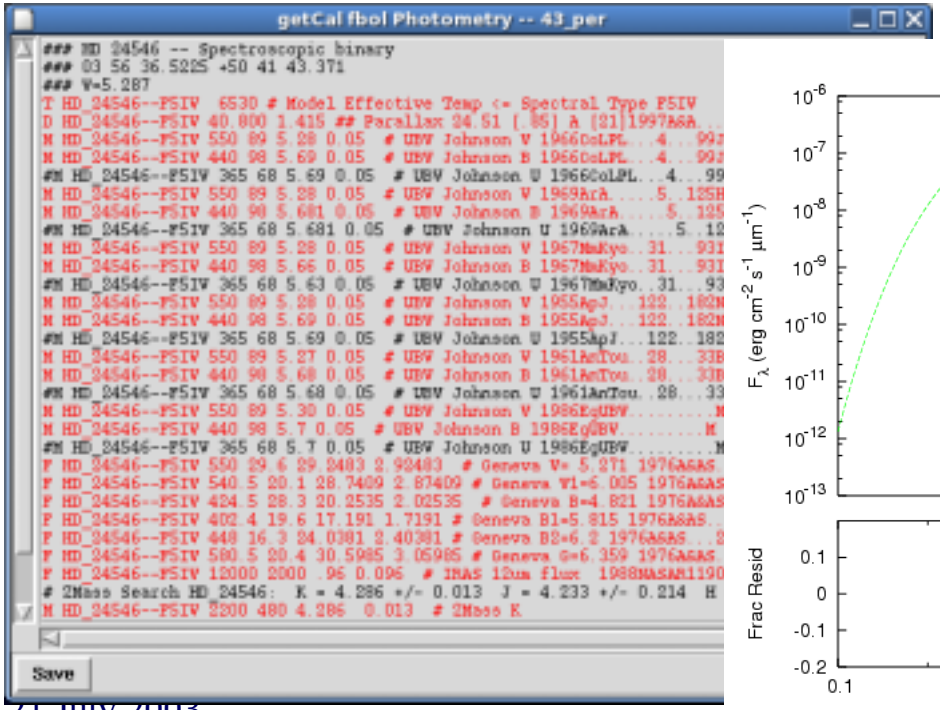
- Provide real-time information (UTC, local time, and track position)
- Output hardcopy to PostScript and bitmap formats

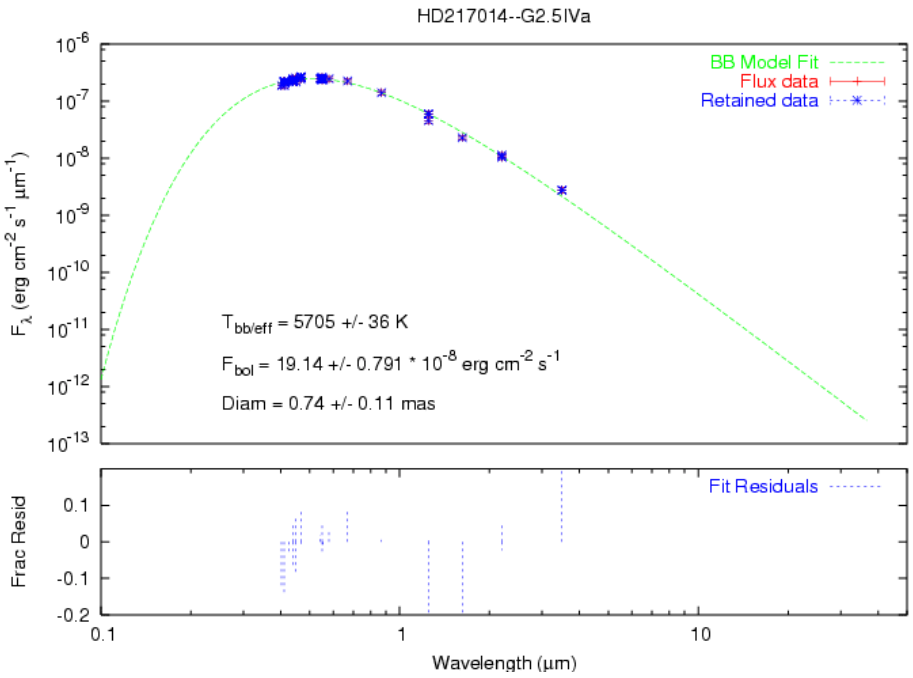


Illustrative Use Cases (3)

- Spectral Energy Distribution/Bolometric flux – effective temperature modeling

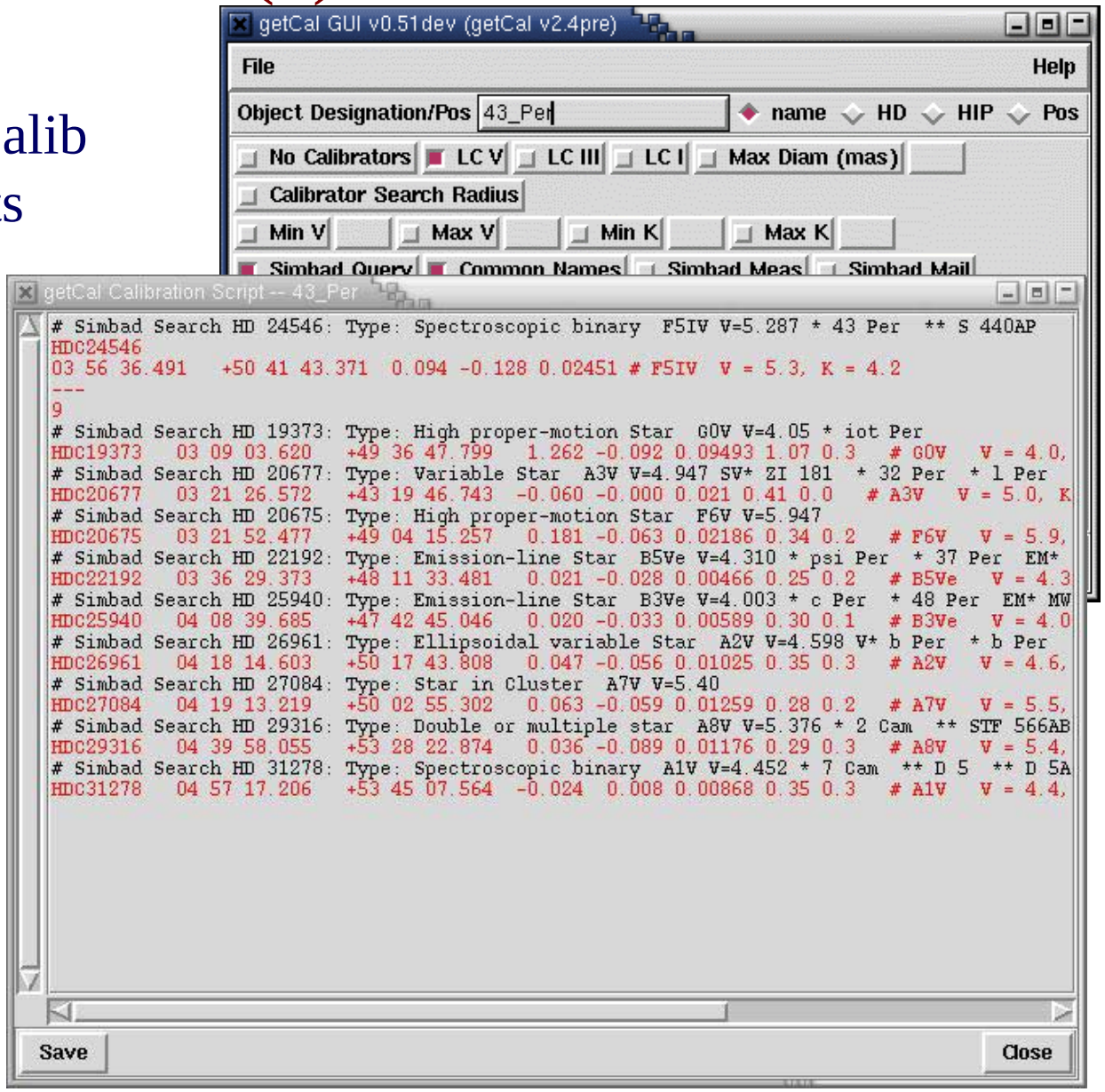






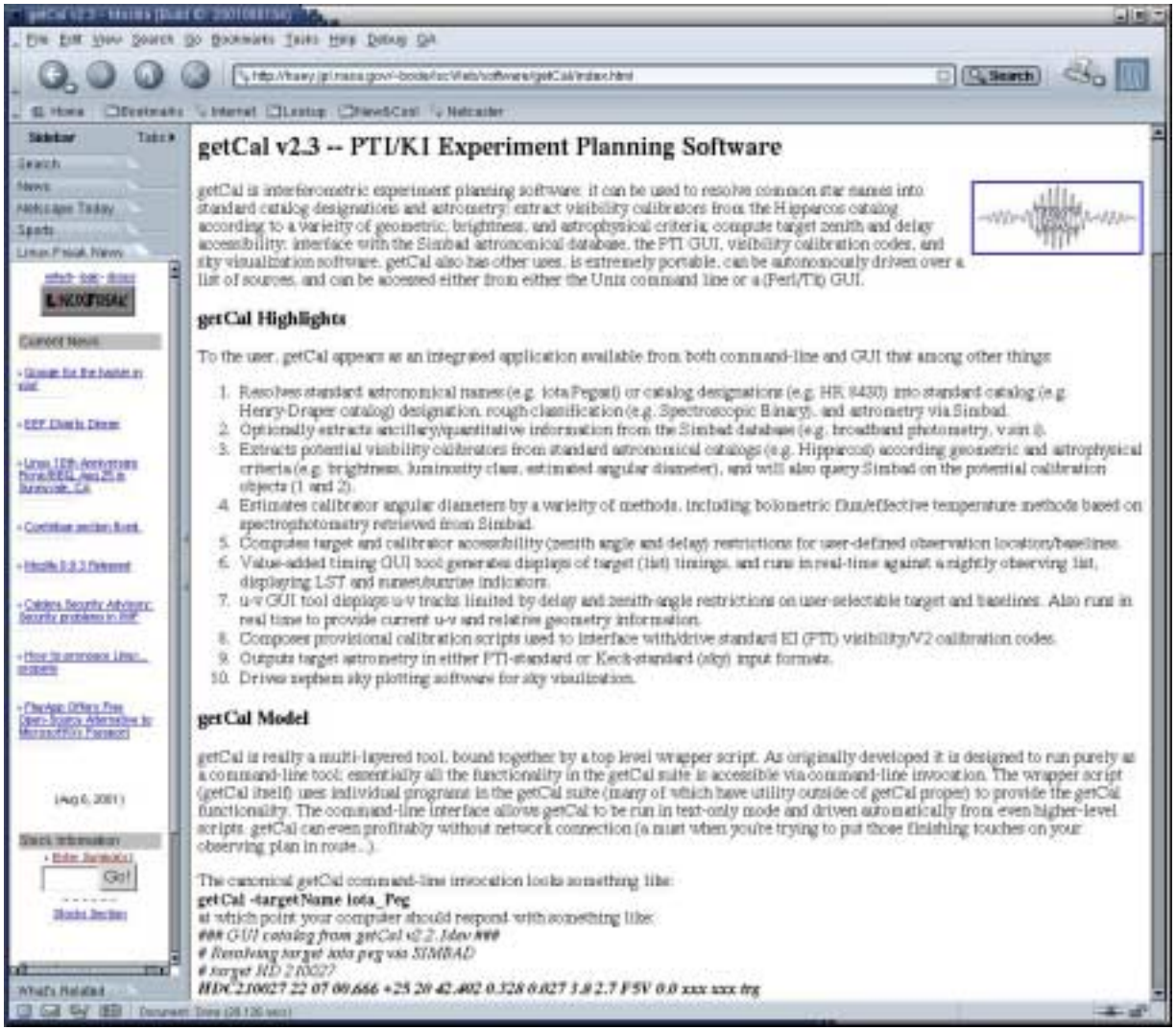
Illustrative Use Cases (4)

- Composing wbCalib calibration scripts



getCal Documentation

- getCal documentation is on-line at msc.caltech.edu
- getCal is freely available through the MSC download portal
- webGetCal will be available in the fall



http://msc.caltech.edu/software/getCal

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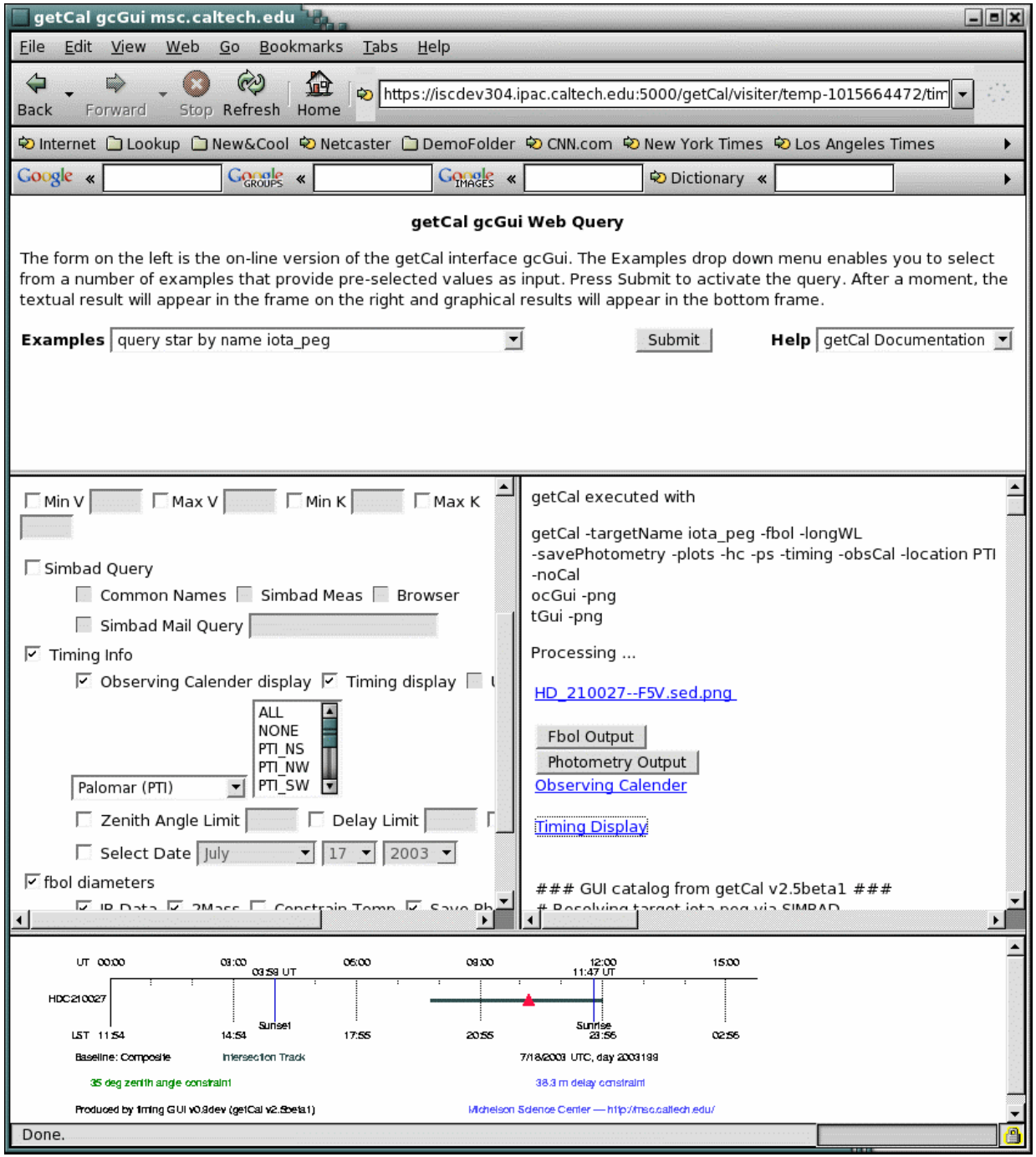
getCalWeb

- Not *complete* vaporware…
- Coming to a URL near you in September.



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getCal Installation & Dependencies

- getCal build/installation recipe:
  - install.getCal – shell script that prepares components
  - install.extern – shell script that makes external symLinks into convenient path location (e.g. /proj/msc/mscSoftware/bin, /usr/local/bin)
- getCal dependencies
  - Perl 5 (e.g. 5.005, 5.6.1)
  - Perl/Tk (800 series)
  - Hipparcos catalog and annexes
  - Lynx (for Simbad and 2Mass access via HTTP)

getCal Coming Attractions

- Interface getCal to additional catalogs (including common calibrator catalog format)
- Add long delay line (LDL) position optimization tool
  - Users can see and optimize LDL position for individual objects or experiment clusters
- Rework build & install procedures in a more standard (i.e. GNU Autotools) methodology
- Visibility modeling/visualization application…

Proposed: Common Calibrators Catalog

- MSC is notionally committed to supporting community-wide common calibrators catalog
- PTI is “about to” make a substantive contribution to this in the form of catalog of ~275 PTI calibrators we have used over the years (forthcoming Lane & Creech-Eakman 2003)
  - Diameter estimates based on PTI data and/or SED modeling
  - $2.5 < K < 5$
- *Propose* to work with ESO (Richichi) & NEVEC (Percheron) to unify calibrator sets into an integrated catalog, and make that catalog available through MSC and ESO distribution mechanisms (e.g. download portal)
- Integrate into getCal search infrastructure

Common Data Format Support

- MSC is committed to supporting IAU WG-Sponsored Data Exchange Format (Pauls & Young) in calibrated data
  - Particularly critical given demise of AIPS++ consortium
  - Best way to do that is to be producing leading the user community by producing data products in this format
- Versions of KI V2 calibration applications that produce data in this format will be available in October
  - Version exists now in testing; library packaging issues need to be addressed